

CLAIMS

We claim:

1. An automated building service broker communicatively linked to a plurality of building systems and to a plurality of service providers, each service provider deemed suitable for performing maintenance and repair on at least one of the building systems, comprising:

a Global Positioning System (GPS) data processor for processing GPS data associated with the communicatively linked service providers, said GPS data corresponding to a geographic position;

an event handler for responding to maintenance and repair events received from the communicatively linked building systems; and,

a service provider selector for selecting a particular service provider to respond to a particular received maintenance and repair event received from a particular communicatively linked building system based on whether said selected service provider is suitable to perform required maintenance and repair on the particular communicatively linked building system, and the geographic position of the particular service provider relative to the particular building system as reported by GPS data associated with the particular service provider.

2. The automated building services broker of claim 1, further comprising:
an event log for recording received maintenance and repair events.

3. An automated building services broker system, comprising:

an automated building services broker comprising an event log database, a maintenance database, a service provider database, equipment database, and a historical database;

a plurality of building sites, each building site having a plurality of building systems, each building site communicatively linked to said automated building services broker; and,

a plurality of service providers communicatively linked to said automated building services broker, wherein each said service provider can perform maintenance and repair on at least one of said building systems.

4. The automated building service broker system of claim 3, further comprising: means for identifying geographic positions of said service providers.

5. The automated building service broker system of claim 3, wherein each building site further comprises:

a control system for monitoring said building systems in said building site, wherein said control system can communicate with said automated building services broker over said communications links between said building site and said automated building services broker.

6. The automated building service broker system of claim 3, wherein each building system further comprises:

a control system for monitoring said building system, wherein said control system can communicate with said automated building services broker over said communications links between said building site and said automated building services broker.

1 7. The automated building service broker system of claim 3, wherein said
 2 communications link between said service providers and said automated building
 3 services broker is a wireline link.

1 8. The automated building service broker system of claim 3, wherein said
 2 communications link between said service providers and said automated building
 3 services broker is a wireless link.

1 9. The automated building service broker system of claim 8, wherein said wireless
 2 link is a pager-type communications network link.

1 10. The automated building service broker system of claim 8, wherein said wireless
 2 link is a cellular communications link.

1 11. The automated building service broker system of claim 3, wherein said
 2 communications link between said building sites and said automated building services
 3 broker is a data communications network.

1 12. An automated building service brokering method comprising:
 2 electronically detecting a need for service in a building system in a building site;
 3 responsive to said detection, automatically selecting a service provider suitable
 4 for servicing said building system, said service provider selected from among a plurality
 5 of service providers suitable for servicing said building system;
 6 providing an electronic notification of said servicing need over a communications
 7 link to said selected service provider; and,
 8 monitoring said communications link for an electronic response to said electronic
 9 notification.

1 13. The automated building service brokering method of claim 12, further
2 comprising:
3 monitoring secondary communications links for said electronic response.

1 14. The automated building service brokering method of claim 12, further
2 comprising:
3 if no electronic response is received, providing at least one additional notification
4 to said selected service provider.

1 15. The automated building service brokering method of claim 12, further
2 comprising:
3 if no electronic response is received, automatically selecting an alternate service
4 provider suitable for servicing said building system;
5 providing an electronic notification to said selected service provider, said
6 alternate service provider selected from among said plurality of service providers
7 suitable for servicing said building system; and,
8 monitoring said communications link for an electronic response to said electronic
9 notification from said alternate service provider.

1 16. The automated building service brokering method of claim 12, wherein said step
2 of detecting a need for service in a building system comprises:
3 sensing an error condition in said building system.

1 17. The automated building service brokering method of claim 12, further
2 comprising:
3 maintaining a maintenance database for tracking routine building system
4 maintenance, said maintenance database comprising at least one record which
5 indicates a scheduled maintenance event for said building system.

1 18. The automated building service brokering method of claim 17, wherein said step
2 of detecting a need for service in a building system comprises:

3 identifying a scheduled maintenance event in said maintenance database.

1 19. The automated building service brokering method of claim 18, wherein said step
2 of detecting a need for service in a building system further comprises:

3 sensing an error condition in said building system.

1 20. The automated building service brokering method of claim 12, wherein said step
2 of selecting a service provider suitable for servicing said building system comprises:

3 querying suitable service providers from among said plurality of service providers
4 for current geographic positions; and,

5 based on said current geographic positions, selecting a service provider who is
6 geographically proximate to said building site.

1 21. The automated building service brokering method of claim 20, wherein said
2 querying step comprises:

3 requesting current geographic positions from said suitable service providers;

4 and,

5 receiving from said suitable service providers, said requested current geographic
6 positions derived from Global Positioning System (GPS) data.

1 22. The automated building service brokering method of claim 12, wherein said step
2 of providing an electronic notification comprises:

3 transmitting an electronic message to said selected service provider through a
4 pager-type communications network.

1 23. The automated building service brokering method of claim 12, wherein said step
2 of providing an electronic notification comprises:

3 transmitting an electronic message to said selected service provider through a
4 computer communications network.

1 24. The automated building service brokering method of claim 12, wherein said step
2 of providing an electronic notification comprises:

3 transmitting an electronic message to said selected service provider through a
4 wireless communications network.

1 25. The automated building service brokering method of claim 22, wherein said step
2 of monitoring said communications link for an electronic response to said electronic
3 notification comprises:

4 receiving an electronic message from said selected service provider through said
5 pager-type communications network.

1 26. The automated building service brokering method of claim 23, wherein said step
2 of monitoring said communications link for an electronic response to said electronic
3 notification comprises:

4 receiving an electronic message from said selected service provider through said
5 computer communications network.

1 27. The automated building service brokering method of claim 24, wherein said step
2 of monitoring said communications link for an electronic response to said electronic
3 notification comprises:

4 receiving an electronic message from said selected service provider through said
5 wireless communications network.

1 28. The automated building service brokering method of claim 12, further
2 comprising:
3 confirming that said selected service provider has responded to said electronic
4 notification.

1 29. The automated building service brokering method of claim 28, further
2 comprising:
3 tracking statistics associated with said confirmed response, said statistics
4 comprising at least one of service response time, arrival time, and service completion
5 time.

1 30. The automated building service brokering method of claim 28, wherein said
2 confirming step comprises:
3 querying said selected service provider for a current geographic position;
4 identifying a geographic position for said building site; and,
5 comparing said current geographic position of said selected service provider to
6 said geographic position of said building site;
7 whereby said comparison can indicate how close said selected service provider
8 is to said building site.

1 31. The automated building service brokering method of claim 30, further
2 comprising:
3 repeating said steps of querying and comparing;
4 whereby said repeated querying and comparing can indicate whether said
5 selected service provider is traveling toward or away from said building site, how fast
6 said selected service provider is traveling toward or away from said building site, and,
7 based on whether said selected service provider is traveling toward or away from said
8 building site and how fast said selected service provider is traveling toward or away

from said building site, when said selected service provider should arrive at said selected building site.

32. An automated building service brokering method comprising:
 transmitting to an automated building service broker geographic position data;
 receiving an electronic request from said automated building service broker to service a building system in a building site;
 responding to said electronic request with an electronic response; and,
 transmitting additional geographic positioning data to said automated building service broker after said step of responding.

33. The automated building service brokering method of claim 32, wherein said transmitting steps comprise:
 receiving from a Global Positioning System (GPS) receiver GPS data; and,
 transmitting said GPS data to said automated building service broker.

34. A machine readable storage having stored thereon a computer program for automated building service brokering, said computer program having a plurality of code sections executable by a machine for causing the machine to perform the steps of:
 electronically detecting a need for service in a building system in a building site;
 responsive to said detection, automatically selecting a service provider suitable for servicing said building system, said service provider selected from among a plurality of service providers suitable for servicing said building system;
 providing an electronic notification of said servicing need over a communications link to said selected service provider; and,
 monitoring said communications link for an electronic response to said electronic notification.

1 35. The machine readable storage of claim 34, further comprising:
2 monitoring secondary communications links for said electronic response.

1 36. The machine readable storage of claim 34, further comprising:
2 if no electronic response is received, providing at least one additional notification
3 to said selected service provider.

1 37. The machine readable storage of claim 34, further comprising:
2 if no electronic response is received, automatically selecting an alternate service
3 provider suitable for servicing said building system;
4 providing an electronic notification to said selected service provider, said
5 alternate service provider selected from among said plurality of service providers
6 suitable for servicing said building system; and,
7 monitoring said communications link for an electronic response to said electronic
8 notification from said alternate service provider.

1 38. The machine readable storage of claim 34, wherein said step of detecting a need
2 for service in a building system comprises:
3 sensing an error condition in said building system.

1 39. The machine readable storage of claim 34, further comprising:
2 maintaining a maintenance database for tracking routine building system
3 maintenance, said maintenance database comprising at least one record which
4 indicates a scheduled maintenance event for said building system.

1 40. The machine readable storage of claim 39, wherein said step fo detecting a need
2 for service in a building system comprises:
3 identifying a scheduled maintenance event in said maintenance database.

1 41. The machine readable storage of claim 40, wherein said step of detecting a need
2 for service in a building system further comprises:

3 sensing an error condition in said building system.

1 42. The machine readable storage of claim 34, wherein said step of selecting a
2 service provider suitable for servicing said building system comprises:

3 querying suitable service providers from among said plurality of service providers
4 for current geographic positions; and,

5 based on said current geographic positions, selecting a service provider who is
6 geographically proximate to said building site.

7 43. The machine readable storage of claim 42, wherein said querying step
8 comprises:

9 requesting current geographic positions from said suitable service providers;
10 and,

11 receiving from said suitable service providers, said requested current geographic
12 positions derived from Global Positioning System (GPS) data.

1 44. The machine readable storage of claim 34, wherein said step of providing an
2 electronic notification comprises:

3 transmitting an electronic message to said selected service provider through a
4 pager-type communications network.

1 45. The machine readable storage of claim 34, wherein said step of providing an
2 electronic notification comprises:

3 transmitting an electronic message to said selected service provider through a
4 computer communications network.

1 46. The machine readable storage of claim 34, wherein said step of providing an
2 electronic notification comprises:

3 transmitting an electronic message to said selected service provider through a
4 wireless communications network.

1 47. The machine readable storage of claim 44, wherein said step of monitoring said
2 communications link for an electronic response to said electronic notification comprises:

3 receiving an electronic message from said selected service provider through said
4 pager-type communications network.

1 48. The machine readable storage of claim 45, wherein said step of monitoring said
2 communications link for an electronic response to said electronic notification comprises:

3 receiving an electronic message from said selected service provider through said
4 computer communications network.

1 49. The machine readable storage of claim 46, wherein said step of monitoring said
2 communications link for an electronic response to said electronic notification comprises:

3 receiving an electronic message from said selected service provider through said
4 wireless communications network.

1 50. The machine readable storage of claim 34, further comprising:

2 confirming that said selected service provider has responded to said electronic
3 notification.

1 51. The machine readable storage of claim 50, further comprising:

2 tracking statistics associated with said confirmed response, said statistics
3 comprising at least one of service response time, arrival time, and service completion
4 time.

1 52. The machine readable storage of claim 50, wherein said confirming step
2 comprises:

3 querying said selected service provider for a current geographic position;
4 identifying a geographic position for said building site; and,
5 comparing said current geographic position of said selected service provider to
6 said geographic position of said building site;
7 whereby said comparison can indicate how close said selected service provider
8 is to said building site.

1 53. The automated building service brokering method of claim 52, further
2 comprising:

3 repeating said steps of querying and comparing;
4 whereby said repeated querying and comparing can indicate whether said
5 selected service provider is traveling toward or away from said building site, how fast
6 said selected service provider is traveling toward or away from said building site, and,
7 based on whether said selected service provider is traveling toward or away from said
8 building site and how fast said selected service provider is traveling toward or away
9 from said building site, when said selected service provider should arrive at said
10 selected building site.

1 54. A machine readable storage having stored thereon a computer program for
2 automated building service brokering, said computer program having a plurality of code
3 sections executable by a machine for causing the machine to perform the steps of:

4 transmitting to an automated building service broker geographic position data;
5 receiving an electronic request from said automated building service broker to
6 service a building system in a building site;
7 responding to said electronic request with an electronic response; and,
8 transmitting additional geographic positioning data to said automated building
9 service broker after said step of responding.

1 55. The machine readable storage of claim 54, wherein said transmitting steps
2 comprise:
3 receiving from a Global Positioning System (GPS) receiver GPS data; and,
4 transmitting said GPS data to said automated building service broker.